NOAA FISHERIES
NATIONAL MARINE FISHERIES SERVICE

Authorizations and Permits for Protected Species (APPS)

File #: 19592
Title: Co-Management of Northern Fur Seals and Stell

Applicant Information

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Project Information

File Number:	19592
Application Status:	Application Complete - Issued
Project Title:	Co-Management of Northern Fur Seals and Steller Sea Lions on the Pribilof Islands Alaska by the Aleut Community of St. George Island - St. George Traditional Council Kayumixtax Eco-Office
Project Status:	New
Previous Federal or State Permit:	14331
Permit Requested:	• MMPA/ESA Research/Enhancement permit

Where will activities occur?	US Locations including offshore waters
Research Timeframe:	Start: 09/14/2016 End: 09/30/2021
Sampling Season/Project Duration:	The proposed activities have been ongoing under NMFS permit #1119-1882 (May 1, 2007-Aug 1, 2009) and #14331 (Aug 17, 2009-Aug 31, 2014). This application covers the continuation of this research for another 5 years and the addition of and collection of beach cast specimens. Research will take place throughout the year. Research on northern fur seals (NFS) is primarily conducted during their presence on St. George Is. (May-Nov); NFS sightings are also documented during the other months of the year. The activities are conducted daily at some locations during the fur seal breeding season and less frequently at other times of year. Monitoring and reporting Steller sea lion presence is conducted on average twice per week from December through May and incidentally while surveying for NFS.
Abstract:	This application is to fulfill our NFS and SSL co-management responsibilities as per the July 2001 Marine Mammal Protection Act Section 119 agreement between NMFS and the Aleut Community of St. George Island. Our Biosample Program will collect, salvage, and accept (from subsistence users) samples from dead stranded and subsistence hunted marine mammals. Samples would range from entire skeletal material to skin samples for genetics, locally-based research projects relating to food safety or ecology, distributed to our NMFS co-management partner, and on a limited request-for-use basis to external researchers with authority to receive the marine mammal samples. We will export unlimited samples of and salvage up to 670 NFS, 35 SSL, 20 harbor seals (HS), 10 individual cetacean, and 10 individual pinnipeds other than NFS, SSL and HS. We will also collect scat, spew, and other samples (e.g., molt, placentae) on the ground from NFS, SSL and harbor seals. Our Entanglement Program will survey using binoculars or round-ups to detect entangled and tagged NFS. Individually or while doing the round-ups, we will capture, disentangle (remove entangling debris), weigh, standard morphometrics, flipper tag, and photograph up to 50 seals; and capture, weigh, and photograph up to 500 already tagged seals. We request annual intentional harassment of up to 30,000 NFS and the capture and weight of up to 200 non-harvested NFS pups while performing the round-ups. Through our Tanam Amgignaa (or Island Sentinel) Program we will monitor fur seal rookeries and other regularly used marine mammal haul out sites directly (via observation) and remotely (via automated time-lapse cameras) to gather census information and to document natural changes, disturbances, and other anomalies. For these programs we request annual incidental harassment of up to 4,900 NFS, 500 SSL, and 10 HS; and 1 unintentional mortality of NFS. The activities will be performed in St. George Island, Alaska. The permit is 5yrs.

Project Description

Purpose: ----------
The Ecosystem Conservation Office (Literature Review / Background)

The Ecosystem Conservation Office (ECO) was formed in 2004 by the Aleut Community of St. George Island Traditional Council to:
1) Maintain cultural interaction with the Bering Sea environment including utilization of its resources;
2) Protect and conserve all life systems - plants, wildlife, and humans that coexist and are interdependent within the island's ecosystem;
3) Guide and direct human activities so as not to negatively impact the environment, natural and/or subsistence resources, and other customary traditional practices;
4) Be respectful of and utilize both indigenous and western approaches to environmental knowledge, wisdom, and science as co-managers with NMFS.

In July 2001, the Aleut Community of St. George Island entered into a co-management agreement under the Marine Mammal Protection Act (MMPA) Section 119 with the National Marine Fisheries Service for the cooperative management of the subsistence use of northern fur seals and Steller sea lions. The activities described herein are in fulfillment of our northern fur seal and Steller sea lion co-management responsibilities. These include our Biosample, Entanglement, and Island Sentinel Programs. The agreement can be found at: https://alaskafisheries.noaa.gov/protectedresources/seals/fur/stgeorge.pdf

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The research permit

This research permit would authorize ECO to perform a variety of MMPA Level A and Level B takes (i.e., intentional and incidental harassment) of Steller sea lions, northern fur seals, and harbor seals.

The permit (Take Table 1) would authorize ECO to:
- capture and weight non-harvested northern fur seal (NFS) pups;
- capture, weight, tag, and disentangle entangled NFS of all life stages, excluding nursing pups and lactating females;
- capture and weight flipper-tagged NFS of all life stages, excluding nursing pups and lactating females;
- intentional harassment of NFS of all life stages, including weaned pups and older, caused by the round-up technique in the process of capture/disentangle more than 1 seal in a group; and
- intentional and incidental disturbance of NFS, HS, and SSL in the process of conducting our Programs' activities.

The permit (Take Table 2) would also authorize ECO to:
(a) receive (from subsistence users) and collect samples from dead subsistence hunted SSL, HS, and NFS;
(b) salvage beach cast (dead stranded) pinnipeds and cetaceans of any species under NMFS jurisdiction; and
(c) temporarily store and distribute (including export) the biosamples for both research and educational purposes. The educational purposes would be incidental to the research after the research objectives have been met.

Educational purposes would be authorized under the permit incidental to research activities, via a citation to 50 CFR 216.37(a)(2)(ii). We envision distributing hard parts for uses such as articulating skeletons with students for display in a school or museum and yes, most samples would be exported. Institutions that may receive samples include the NMML, the National Marine Mammal Tissue Bank, Pacific Identifications Inc., University of Alaska Fairbanks, University of British Columbia, and Matson's Laboratory. As stated by standard NMFS permit conditions, the Permit Holder is ultimately responsible for compliance with the permit and applicable regulations related to the samples unless the samples are permanently transferred according to NMFS regulations governing the taking and importing of marine mammals (50 CFR 216.37) and the regulations governing the taking, importing, and exporting of endangered and threatened species (50 CFR 222.308)."

The permit would authorize up to one unintentional mortality of NFS.

I. Biological Sample Collection (Biosample Program)

Purpose/Objectives:

The objective of the Biosample Program is to:
(a) receive (from subsistence users) and collect samples from dead subsistence hunted marine mammals;
(b) salvage beach cast (dead stranded) marine mammals; and
(c) temporarily store and distribute (including export) the biosamples for both research and educational purposes. The educational purposes would be incidental to the research after the research objectives have been met.

ECO desires to continue to collect tissue samples from marine mammal species for research via collaborative partnerships. Samples may be used for locally-based research projects relating to food safety or ecology, distributed to our NMFS co-management partner, and distributed on a limited request-for-use basis to external researchers with authority to receive marine mammal samples. Sample collection ranges from entire skeletal material to skin samples for genetics. Samples may be hard parts (e.g., skulls, skeletons, teeth), soft tissues and/or whole carcasses. The export of tissues may occur on a quarterly or as needed basis depending on the timeframes of individual collaborating researchers.

An example of the sort of research projects that will be undertaken by ECO with the biosamples is marine mammal tooth collection and aging (described below). In addition, external requests for tissue samples from accredited/authorized researchers occur regularly (e.g. for genetic, food safety, or toxicology investigations). We believe there is great positive value in getting as much information as possible from the samples. Therefore, as long as the research is valid and in no manner commercial, we want to be able to facilitate these activities by collecting and distributing regularly collected samples or new requests for tissues. New requests from authorized recipients to St. George ECO will be coordinated with and cleared by the Permits Division of NMFS Office of Protected Resources prior to our undertaking any new collection and/or distribution activities especially as the recipient must be legally authorized under the MMPA/ESA to receive the samples requested.

It is not possible to list the specific programs that will request biosamples prior to the request occurring. Institutions usually have multiple research programs many of which may request biosamples. At this time we have not identified any foreign laboratories or researchers that we would export samples, but have worked with the British Columbia researchers in the North Pacific Universities Marine Mammal Research Consortium. Therefore, ECO would like to request under this permit the authority to conduct the proposed activities (see take table) for current and future researchers and research projects on a case-by-case basis. In addition, we request the authority under the research permit to collect hard and soft parts from unidentified dead stranded cetaceans or pinnipeds, other than northern fur seals, Steller sea lions and harbor seals.

Literature Review/Background:

The Aleut Community of St. George Island Traditional Council has regularly assisted the National Marine Mammal Lab (NMML) staff and other independent researchers (under their respective permits) in the collection and distribution of biological samples from numerous marine mammal species, including but not limited to northern fur seals, harbor seals, and Steller sea lions. It is our desire to possess a NMFS permit of our own, as we have previously held, to continue to collect and distribute biosamples from marine mammal species for research. Biological samples are used by researchers in a wide array of projects ranging from population genetics (from tissue samples), foraging ecology (from scat or stomach samples), and diet (from whiskers). There will be, without doubt, future investigations relying on biological samples for which techniques currently do not exist. A project currently underway on subsistence harvested animals that collaborates with NMML and their collaborators includes the collection of teeth to monitor the age-composition of the subsistence harvest; collection of whiskers, stomachs, and scat to investigate diet; collection of nasal swabs to investigate disease exposure; and the

collection of organs and tissues to examine health and disease exposure.

In sum, our community maintains a strong cultural and subsistence food dependence on northern fur seals, Steller sea lions, and harbor seals and is concerned with the declines. The absence or decline of these species on St. George Island represents significant negative changes to our way of life. It is thus imperative that we contribute to an understanding of the different species. Collecting and distributing biological samples is a valuable contribution to our co-management efforts with NMFS.

Our Biological Sample Program is based largely on our experience with subsistence hunting and harvest practices on St. George and dead salvage. In addition we have adapted aspects of the St. Paul ECO biological sample program to improve the collection of marine mammal parts for scientific research from subsistence hunted northern fur seals, harbor seals, and Steller sea lions on St. George Island. Beginning in 1999 the St. Paul Island ECO began to collect, under Scientific Research Permit 704-1444 issued to the University of Alaska, stomachs, colons, skulls, tibia/fibias and other parts from subsistence hunted Steller sea lion in collaboration with Dr. Alan Springer for the purpose of developing a long-term dataset of sea lion diets. The hard parts went to the University of Alaska Marine Mammal Museum for archival purposes and requests for future opportunistic research. St. George ECO began collaboration with NMFS Alaska Region and NMML to collect tissues and teeth from harvested northern fur seals and Steller sea lions, but did not institute the formal St. Paul ECO agreement process. St. George has also provided samples to Alaska Department of Fish and Game's Steller Sea Lion Program; Alaska Sea Life Center's contaminants monitoring project; University of Alaska Marine Mammal Museum's archiving project. Presently, St. George Island ECO will continue its collaborative research efforts with the National Marine Mammal Laboratory, the Alaska Region, and their collaborators, as appropriate.

I-a. Marine Mammal Tooth Collection - Purpose/Objectives and Literature Review / Background:

The objective of this project is to provide an accurate age determination for all seals taken during the St. George subsistence harvest. Currently, St. George ECO collects teeth from up to 100% of the sub-adult seals that are taken for subsistence on St. George Island. These samples are currently collected for the NMML by ECO under the NMML permit for the collection of marine mammal parts for scientific research (Parts Permit #18638, expires 01/31/2020), and previously under permit #13583 (expired January 2015), and permit #782-1694 (expired December 2008). It is often necessary to collect biosamples (see above) from a sub-sample of harvested seals. This project will provide age information on seals sampled for ongoing pathology, health, and diet studies conducted by the NMML, in addition to any biosample requests related to other research. The ECO will collect the snouts from subsistence harvested fur seals, process them on-island to remove the canine teeth for subsequent aging. Under this permit, the ECO will also collect skulls or snouts to subsequently remove teeth taken as subsistence or collected as dead stranded specimens on St. George Island. As stated above, the objective of the ECO marine mammal tooth collection project is to provide full information on fur seals and other species that are sampled for ongoing pathology studies conducted by the NMML, as well as any biosample requests or other research. The primary species for which tooth samples will be collected will be northern fur seals.

The Aleut Community of St. George Island has participated in the collection of teeth for research purposes during the local fur seal subsistence harvest since the cessation of the commercial fur seal harvest. As a part of our current fur seal subsistence harvest monitoring program, the Aleut Community of St. George Island Traditional Council via their Kayumixtax ECO department collects all canine teeth from harvested sub-adult fur seals to be aged at the NMML. However, some seals from the same group of subsistence seals are sampled for additional studies (e.g. ongoing NMML pathology studies, biosamples collected for NMML and other researchers) such that corresponding age information adds additional value to these investigations. ECO also collects teeth from Steller sea lions harvested for subsistence. The root of pinniped canine teeth is where the age layers are counted. The teeth must be properly processed in order to remove them from the jaw without damaging the growth layers in the root, then cleaned, and dried prior to storage and shipment. The objective of this project is to provide an accurate age determination for all seals taken during the subsistence harvest, and ensure that age information is included with other life history investigations. The ECO will also collect teeth in order to determine the ages of any dead stranded animals that are not sampled by the NMML during other population studies. This will provide full information on seals sampled for ongoing pathology studies as well as any additional biosample requests and other types of research conducted on our subsistence harvest.

I-b. Subsistence Food Safety, Health, and Security - Purpose/Objectives and Literature Review / Background:

The objective of this project is to ensure all seals taken during the St. George subsistence harvest are safe for human consumption, healthy individuals, and we have a secure subsistence food resource in the future. Currently, St. George ECO collects nasal swabs from harvested seals to examine disease exposure some of which have the potential to infect human consumers. These samples are currently collected for the NMML by ECO under the NMML permit for the collection of marine mammal parts for scientific research (Parts Permit #18638, expires 01/31/2020). St. George ECO is interested in being prepared to sample the subsistence harvest in the event of future changes in the environment or analyses emerge which could affect our livelihood on St. George. In order to understand the health of pups collected, we intend to weigh non-harvested female and male pups during the process of subsistence harvesting from September through November.

The Aleut Community of St. George Island has participated in the collection of numerous tissues for research purposes during the local fur seal subsistence harvest since the cessation of the commercial fur seal harvest. In 2014, NMFS collaborated with researchers from Colorado State University to examine radiation exposure of northern fur seals on St. Paul Island as a result of the tsunami in Japan and the resulting Fukushima disaster. Ongoing research into the health and disease exposure of northern fur seals may require further sampling and analyses of tissues from fur seals harvested for subsistence purposes. In 2014, St. George was authorized to harvest 150 male northern fur seal pups. It is our expectation that there will be interest from researchers to understand the food safety, health, and biology of harvested pups and possibly those pups not harvested. Regulatory provisions authorizing the harvest of pups on St. George require harvesters to handle and sex pups to detect and avoid female pups. Since female pups will be rounded-up, handled, and not harvested we propose to weigh those non-harvested pups as an index measure of their condition. This will provide NMFS and ECO previously unavailable data on pup growth and condition as they approach weaning. Opportunities for new sampling from harvested Steller sea lions may arise that we can support through our research permit.

II. Entanglement Program

Purpose/Objectives:

The primary goal of this project is to address the persistent problem of northern fur seal entanglement in derelict fishing gear and other marine debris. The activities proposed under this permit are designed to:
a) Improve the survival of entangled northern fur seals on the Pribilof Islands, by capturing, restraining, removing of debris and releasing them back in the wild;
b) track the rate of entanglement as a long-term measure of the success of any efforts intended to reduce fur seal mortality due to entanglement; and
c) identify the source of entangling debris to better target management efforts to prevent future fur seal entanglement.

This application integrates all expected takes during directed entanglement activities. In order to understand how entanglement rates may be changing we intend to use a combination of visual surveys and round-ups to detect entanglements. In addition, entanglements may be observed incidentally during harvest round-ups for subsistence purposes, and our intention is to disentangle and release those seals safely, if practical, during the subsistence harvest.

Literature Review/Background

The Aleut Community of St. George Island's co-management agreement with NMFS specifically authorizes the Aleut Community of St. George Island via the Tribal Government "To reduce the level of entanglement and effect the release of fur seals and sea lions from marine debris..." by performing the following activities:
"a) Collection of information regarding date, location, sex, age class, debris type, capture attempts, disentanglements...", and
"b) Calculation of entanglement rates..."

Accordingly, the ACSTG-TC-Kayumixtax Ecosystem Conservation Office (ECO) has increased their capacity to conduct research and monitoring studies in recent years. Continuation of this program is necessary to further address the issue of fur seal entanglement and progress toward preventing future entanglement by addressing the source of marine debris. No methods have been developed that can be used or expertise gained by personnel on St. George to safely capture, restrain, and disentangle any Steller sea lions and as such we are not requesting any response authority for entangled Steller sea lions. Entangled SSL may be observed and photographed.

The St. George Island ECO were previously (since June 2004) permitted to survey for, observe, and disentangling fur seals under Scientific Research Permit 0481-1623 (expired 1/31/07) issued to LGL Limited Environmental Research Associates, and in which Mr. Michael Williams was a Co-Investigator, and under NMFS permit 1066-1750 issued to Michael Williams which expired June 30, 2009. Mr. Williams is currently Pribilof Islands Fur Seal Coordinator with the National Marine Fisheries Service, Alaska Region working to implement the co-management agreement and coordinate northern fur seal research. We were also authorized for some of those activities under NMFS research permit No. 14331 that expired on August 31, 2014.

III. Tanam Amgignaa (TA, Island Sentinel) Program

Our Tanam Amgignaa (or Island Sentinel) Program (TA) includes the integration of the biosample and entanglement programs, general island observations, research integrated into subsistence activities, and intermittent research projects. The underlying objective of the TA is to record regular and repeated observations of the presence of marine mammals using habitat known through Traditional Ecological Knowledge and Wisdom. This information is then able to be incorporated more easily into decision-making regarding management and co-management activities on St. George Island. The TA has collected and recorded information regarding marine mammal presence and changes in the physical habitat, but in recent years has come to include collection of specific research project data. Specific marine mammal data has included observations to address timing of the seasonal arrival and departure of fur seals, observing and recording tagged or branded pinnipeds to support NMFS efforts to estimate vital rates of Steller sea lions and fur seals and collection of Steller sea lion scat to examine winter diet.

Sentinel Program - Purpose/Objectives

The objectives of our Tanam Amgignaa (TA) or Island Sentinel Program are to advance stewardship and active responsibility of and for the St. George Island ecosystem. The program provides a centralized community forum to promote environmental education, outreach and cultural awareness through community-based monitoring. From its inception, the TA program has incorporated year-round observations of marine mammals on St. George Island, with special focus on northern fur seals and Steller sea lions as cornerstone of the co-management agreement with the NMFS. St. Paul Island's TA program was used as a model for development of a TA program on St. George Island allowing for collaborative opportunities to share data between the two communities and NMFS. The TA program consists of a combination of direct observations by ECO Island Sentinels and reports of observations from local community members, which are subsequently verified.

In addition, remote observation via time-lapse weather-housed cameras are used to determine seasonal presence/absence and census counts of harbor seal and Steller sea lions.

These cameras are often placed at cliff-top locations or stands near enough to identify the presence and count the species using these traditionally identified habitats. Additional camera locations are being evaluated for application to northern fur seals (e.g. female and pup numbers, timing of arrival, entanglement rates, and life history information) can be obtained using remote time-lapse photography.

Background
The research purpose of marine mammal observations made by the Tanam Amgignaa program is both broad (general) and narrow (specific) in scope. Our general purpose is to be the eyes on the ground/ early warning system for any ecological impact likely to affect the well-being of the animals. This would include any unusual occurrences that might indicate a problem for the species that may possibly have larger ecological implications. If something is spotted, we record the incident and contact the appropriate authority (e.g. NMFS). We have a number of specific purposes when conducting behavioral observations. Primarily we are looking for entangled animals, oiled animals, and any signs of disturbance. NMFS owns land on St. George designated for the conservation of fur seals. There are seasonal restrictions on access to these lands such that from June 1 until October 15th disturbance could occur due to trespass or tourists operating outside of their agreements to view fur seals at designated locations. In addition, we track disturbance caused by our activities by counting the numbers of animals observed responding at a level considered "taking' under the MMPA. We are also recording life history data, such as the timing of arrival and departure of seals, tag numbers and reproductive status, and the date of first births on an annual basis. These data when analyzed over long time periods (e.g. 10-20 years) are likely to be valuable records of species responses to environmental variables such as climate change.

Current program components integrated into the TA Program that are related to marine mammals include:
- Northern Fur Seal Rookery Monitoring
- Northern Fur Seal Entanglement Monitoring
- Steller Sea Lion and Harbor Seal Haulout Monitoring
- Marine Mammal Stranding Response
- Subsistence Harvest Monitoring
- General Fish and Wildlife Monitoring
- Remote Time-Lapse Photographic Monitoring
- Northern Fur Seal Life History and Behavior

Description: Study area

The Pribilof Islands are located in the central Bering Sea, approximately 185 mi (300 km) north of the Aleutian Chain, at approximately 57°? North Latitude/170° West Longitude. The Pribilof archipelago includes the two larger, inhabited islands of St. George and St. Paul plus two small islands; Otter Island and Walrus Island. Otter Island is located roughly 9 mi (14 km) south of St. Paul, Walrus Island about 7 mi (11 km) east of St. Paul. Sea Lion Rock is a small rocky outcropping located less than a quarter mile offshore of the southern tip of St. Paul.

I. Biological Sample Collection Program (Methods)

Scats will be mostly collected in late-summer/fall (August-December) and winter/spring (January-May). Scat collection in St. George usually occurs when there are no animals in the area; therefore, incidental harassment of seals is minimized.

Protocol – Biosample Program

All parts and specimens will be collected in the field as fresh as possible, usually within 24 hours of a harvest, hunting, or stranding event. Samples will be placed in one of the following containers:
• A plastic/glass/Teflon canister, jar or vial with a positive closure.
• Plastic whirl-pak, zip-loc, or heavy duty trash bag.

- Labeling
Each sample is assigned an accession number once received at ECO and entered in the ECO Tanam Amgignaa (Island Sentinel) Database. Accession numbers facilitate the biosample processing by first recording date of entry and associated documentation surrounding the biosample, such as: date of collection, species or common name, general harvest location, sex, listing of the samples in the biosample, and collector provided remarks.

- Storage
All samples except teeth, vibrissae, hair, cleaned skulls, skeletons, and bones will be stored in containers or bags in standard freezer conditions at 25ºF or below, unless specified and agreed upon by the ECO and collaborating researcher.

- Transportation
All samples except teeth, vibrissae hair, cleaned skulls, skeletons, and bones will be packed and shipped in leak proof containers, such as ice chests or Rubbermaid containers. Frozen samples will be shipped frozen in leak proof containers with ice packs or dry ice, unless specified and agreed upon by the ECO and collaborating researcher. All samples will be shipped with a copy of the biological samples collection forms and a copy of both parties' current scientific research permits. The ECO will notify the receiver of shipment at least 24 hours in advance to make sure parties available to receive shipment. On one side of the outer package will include the following information; Addressee, Addressor, and "This package conforms to 49 CFR 173.4."

Protocol - Marine Mammal Tooth Collection

The primary species for which tooth samples will be collected will be northern fur seals. Under the previous agreement and sampling protocol established by NMML for collection of teeth from juvenile male northern fur seals taken on the subsistence harvest, ECO collects both upper canine teeth (n=2) from approximately 100% of the harvested seals. The NMML does not currently retain the lower canine teeth from fur seals sampled at the subsistence harvests. ECO is requesting a permit to collect both upper canine teeth (n=2) from any harvested juvenile male fur seals that are not sampled for the NMML in order to determine the age of these seals. We also want to collect both lower canine teeth (n=2) from seals sampled under the NMML protocol. If additional requests are made for subsistence harvest teeth by other researchers, these requests will be handled through the biosampling program. There is no take associated with processing or sectioning of marine mammal teeth. We may collect a total of four teeth per seal.

To determine the age of harvested seals, ECO Research Assistant(s) need training to learn to identify the annual growth layers on each tooth macroscopically to determine the age of the seal. When funding is available, ECO will prepare and section an appropriate sample of teeth to confirm macroscopic counts of annual growth lines. Once trained ECO's age estimates will be compared and reconciled to the NMML age readings of the upper canine teeth from the same seals to insure consistency in methodology and ageing between the two organizations. The tooth samples may be retained by the ECO and will be used to develop local capacity to prepare thin sections of teeth to read nursing lines in the first annual growth layer when funding is available.

Additionally, ECO Research personnel will collect teeth from other subsistence harvested/hunted and dead stranded marine mammal species on St. George Island, including harbor seal and Steller sea lion. These samples of teeth will be entered in to the ECO Tanam Amgignaa (Island Sentinel) Database. Steller sea lion and harbor seal teeth will be sent to NMML for aging and storage. Teeth collected from salvaged dead stranded marine mammals will be sent to the organization identified by NMFS. The age data from the teeth collected from subsistence harvested species will also be incorporated in to the annual subsistence harvest reports.

Protocol - Subsistence Food Safety, Health, Security

We may collect a organs, tissues, blood, skeletal material, and weight of seals harvested. We would also collect the weight of non-harvested animals. St. George is authorized to harvest up to 500 juvenile male seals annually. St. George can harvest up to 150 male fur seal pups of the 500 total, such that 350 juvenile males and 150 male pups could be harvested in any one year. Because the regulatory restrictions require the handling of pups to determine their sex it is likely that up to 150 female pups would be handled and released. In addition, there may be circumstances where male pups may be handled, but not be selected for harvest. Therefore, up to 200 pups may be captured and weighted and released. Steller sea lions are a regularly hunted marine mammal on St. George, but there are no regulatory restrictions on the taking of this species. No more than 35 Steller sea lions would be expected to be harvested in any year and we request to sample all those harvested. Harbor seals are not frequently harvested on St. George island, but they could be, and as such we request the sampling of this species as well. The details of which are explained below.

The objective of this project is to ensure all seals taken during the St. George subsistence harvest are safe for human consumption, healthy individuals, and we have a secure subsistence food resource in the future. St. George ECO is interested in being prepared to sample the subsistence harvest in the event of future changes in the environment or analyses emerge which could affect our livelihood on St. George. In order to understand the health of pups collected, we intend to weigh non-harvested female and male pups during the process of subsistence harvesting from September through November. In addition ECO biosampling intends to support ongoing or future pathology, health, diet, or condition studies conducted by the NMML or their collaborators. The primary species for which samples will be collected will be northern fur seals and Steller sea lions.

ECO Research personnel will weigh up to 150 female and 50 male non-harvested fur seal pups. These weight data will provide an index of growth and condition over time and will become part of the time series of data on pups to enhance those NMML data collected during pup tagging and production. Steller sea lion and harbor seal samples will be sent to NMML for analysis and storage. Samples collected from salvaged dead stranded marine mammals will be sent to the organization identified by NMFS. The sampling and age data from the teeth collected from subsistence harvested species will also be incorporated in to the annual subsistence harvest reports and integrated into subsequent co-management analyses.

Take – Biosample Program

For this program we request:
- incidental harassment/disturbance of peripheral northern fur seals caused while collecting samples from subsistence hunted and dead stranded (beach cast) marine mammals;
- annually export unlimited samples (hard and soft parts) of and salvage 670 from northern fur seals, 35 Steller sea lions, 20 harbor seals, 10 cetaceans and 10 pinnipeds other than Steller sea lions, Northern fur seals, and harbor seals; and
- weighing up to 200 pups that are not harvested related to the Subsistence Food Safety, Health, Security research.

Samples collected, salvaged and/or accepted are highly opportunistic, and we are unable to predict the exact number, species and nature of the samples to be salvaged or collected from subsistence users or stranded animals. Recovery and/or salvage of a sample are highly dependent upon the state of decomposition.

We expect any Level B take (incidental harassment/disturbance) associated with biological sample collection to be low. Northern fur seal biological samples and measurements (length and weight) will be collected primarily during the subsistence harvest season, which will involve no additional disturbance in addition to that already exempted for subsistence activities.

The two situations where there could be Level B incidental harassment disturbance takes of northern fur seals while collecting marine mammal parts are (1) during sampling of an animal taken during subsistence hunting activities (e.g. Steller sea lion) and (2), when sampling a dead stranded animal. Such cases are expected to be infrequent.

The reason no Steller sea lions or harbor seals would be incidentally harassed due to sample collection is that on-island habitat used regularly by Steller sea lions or harbor seals is either inaccessible from land, not a subsistence hunting location, or not a nearshore catch-all location where carcasses wash ashore.

II. Entanglement Program (Methods)

Disentanglement captures and incidental disturbance of nearby seals caused by disentanglement activities are included in this permit application.

To accomplish the three goals we propose to: detect, respond, and capture entangled fur seals observed on the St. George Island, Alaska.

Our Entanglement Program will survey using binoculars or round-ups, photograph as possible, and capture entangled northern fur seals to remove entangling debris. In addition our entanglement program will also detect tagged known-aged seals during our surveys. We will also capture these tagged seals, photograph as possible, and record the individual tag numbers observed using the same techniques applicable to entangled seals. Entangled Steller sea lions may be observed and photographed during our other program activities, but due to their larger size than northern fur seals we will not attempt to capture an entangled Steller sea lion. Northern fur seals aggregate on land and younger seals able to be captured and handled safely are seldom observed alone.

Although our disentanglement efforts will be focused on live entangled juvenile male and pup northern fur seals from June through November on the Pribilof Islands, we request all life stages to be authorized. Based on directed entanglement research combined with subsistence harvest round-ups from St. Paul Island from 1998-2005; of 795 potential fur seal entanglements 337 captures were attempted and 282 fur seals were successfully disentangled. No directed research on fur seal entanglement was conducted on either island from 2006 through 2014. During 2006-2014 subsistence harvest round ups on both islands observed 37 entangled seals. Of these 37 entangled seals 28 capture attempts were made and 28 seals were disentangled. An additional 5 seals were captured which had scars or wounds indicative of prior entanglement, but no debris was actually on the seals. Three seals were observed with scars but not captured.

Once captured/restrained entangled fur seals will be disentangled, weighed, flipper tagged, and released. Entangled fur seals will be captured with either a noose pole or capture net. Seals will be restrained in a specially designed restraint board or within the capture net. Because our methods to detect entangled seals will result in the detection of tagged seals we will use the same methods to capture tagged seals to weigh and record their identity (i.e., tag number). These tagged seals both serve as controls to investigate the effects of entanglement and contribute to NMFS investigation of juvenile survival rates. Seals are detected three ways: during subsistence harvests, during directed research round-ups, or during observational surveys related to the TA program.

Once we establish the number of entangled and/or tagged seals among non-entangled or un-tagged seals from the round-ups or surveys we can estimate and compare juvenile

male and pup fur seal entanglement rates and debris composition between St. George and St. Paul Islands, both within and among years.

Protocol – Entanglement Program

Objective a. Disentanglement-Improve the survival of entangled northern fur seals on the Pribilof Islands, by capturing, restraining, removing of debris and releasing them back in the wild.

Disentanglement crew members will search for entangled seals during observational or round-up surveys at specified trend sites. In addition, non-survey areas will be regularly scanned for entangled seals and entanglement surveys will also be a regular part of subsistence harvest activities. Regular surveys will be done from vantage points overlooking the rookeries and haulout areas, and will be done using spotting scopes and binoculars to scan the area to see if there are any entangled seals. The public and other researchers may observe entangled seals and report them to the disentanglement crew for response. Once entangled seals are detected we will evaluate whether the circumstances allow us to independently attempt to capture the seal or round-up the entire group of nearby seals including those entangled. Independent captures allow us to improve the survival of individual entangled seals, but does not allow us to capture multiple "target" (i.e., entangled or tagged) seals or to estimate the proportion or rate of entanglement (see section II-b.) To minimize disturbance we will move slowly with a low profile, stop if animals show signs of stress, and wear clothing that blends into the surroundings.

When possible, entangled fur seals will be captured with noose poles or capture nets and as necessary secured on a restraint board to prevent injuries to the fur seal or to researchers as described in Gentry and Holt (1982). Captures begin by slowly crawling towards the subject while making maximal use of the local topography (e.g. boulders, etc.) to allow close approach without being detected. Such an approach minimizes disturbance to any surrounding seals while getting within capture range of the potential subjects. For temporary restraint, we will employ a standard neck-squeeze type restraining board (see Antonelis, 1992) combined with a neoprene "H" or "E" harness that serves to hold the seal's fore-flippers in tight against their body. While securely restrained, the seal is disentangled (e.g. the net, packing band, etc., is cut with side-cutting pliers and carefully removed). Disentanglements typically take between five and twenty minutes to complete. We will attempt to clearly mark seals that are captured and disentangled by shearing away a visible line of guard hair on the neck/shoulder region of each side to expose the light colored under-fur or to apply Allflex narrow tags to the trailing edge of the front flippers. This is done to insure that the entangled portion of the population is sampled "with replacement" (Fowler 1987). Tagging previously entangled seals will allow us to individually compare the survival of known disentangled seals to similar aged seals not entangled that are part of the tagged cohort in the NMML vital rates program. Seals are released by first removing the neoprene harness and then lifting the headboard. All crew have moved 5-10 m away from the seal at this point and remain low and still while the seal moves away.

By conducting independent captures in the manner described above, disturbance to adjacent seals will be minimized. In situations where capture attempts will cause unacceptable disturbance to haul out areas, sightings will be recorded (and seals photographed) and the location of entangled seals will be monitored to the greatest extent possible to increase the likelihood of future capture opportunities. An estimate of the number of seals disturbed during any capture attempt will be recorded.

The age class of captured and disentangled fur seals will be estimated using standard evaluation protocols based on size, vibrissae color and pelage characteristics (Scheffer 1962, Vladimirov and Nikulin 1993). The type and weight of debris, mesh size or circumference of entangling loop, and the extent of the wound created by the debris will also be recorded. Debris will be catalogued and retained for use in identifying the source of the debris.

Objective b. Proportion and rate of entanglement - track the rate of entanglement as a long-term measure of the success of any efforts intended to reduce fur seal mortality due to entanglement; and

We will also conduct surveys to estimate the rate of entanglement for different age and sex categories of fur seals at selected study sites. We will use observational surveys to monitor adult female, and pup fur seal entanglement. We will use round-up surveys to monitor juvenile male fur seal entanglement during the summer on the hauling grounds. Adult female fur seal observational surveys will occur during the summer on the rookeries, where they are located reliably due to their life history, but will only occur concurrent with other research by NMML such as counting adult males rather than as a separate project. Pup fur seal entanglement surveys will occur during the autumn at numerous locations after they begin to spend significant portions of their time in the water and away from the rookeries. During observational surveys, researchers use binoculars to count entangled and non-entangled fur seals at sampling sites on rookeries and haul outs. Specific sites are selected for repetitive sampling of adult females, and pups from cliff tops overlooking rookeries and hauling grounds. Based on prior work conducted on St. Paul Island in 2004 and 2005 (Zavadil et al., 2005 & Zavadil et al., 2006) non-cliff top sites do not result in reliable and balanced detection of entangled and non-entangled seals. Sites are selected to insure that the viewing location is reliable and to avoid disturbance to adjacent seals during most wind conditions. Seals are counted within the defined sampling areas on haul outs and rookeries. Each survey site is surveyed 1-2 times per week, subject to visibility and wind conditions, with a crew of one or two people. Criteria will be developed to reliably detect and count entangled and non-entangled seals to ensure assessments of entanglement have adequate power to detect a 50% change in the annual rate of entanglement.

We will also conduct round-up surveys to estimate the rate of entanglement for juvenile male fur seals at selected study sites. Round-up surveys will occur during the summer on hauling grounds, where juvenile males are located reliably due to their life history. Juvenile females return from their annual migrations later than males and when they return to the islands are herded into the breeding grounds by adult male fur seals. This difference in life history between juvenile male and female fur seals results in our general inability to accurately detect and quantify the rate of juvenile female entanglement. Round-up surveys randomly sample males on the hauling ground and entangled and non-entangled seals have an equal probability of detection. Crew samples the juvenile male fur seals by encircling the inland hauling ground they occupy and herding those seals further inland. Crew subsequently releases the fur seals single-file towards the water, counts every individual and notes those entangled to determine the proportion of seals entangled. Additionally the counts can be further sub-divided into harvestable (approximately 2-4 years old) and not harvestable (greater than 5 years old) categories to facilitate comparison with historical entanglement data. All entangled and non-entangled seals in a particular age or sex category observed in the count are included in the sample. During the release of the rounded-up seals those entangled seals can be captured and disentangled. The round-up method allows for a higher probability of detecting entangled seals and therefore disentangling them. The method is more technically complicated in that it requires a greater number of people involved and results in greater incidental harassment of seals not entangled. Due to the higher rate of detection of entangled seals and the higher probability of successful capture the round-up method significantly improves the survival of a greater number of entangled seals and provides a more accurate estimate of entanglement for the minor negative effect of additional incidental harassment of juvenile male fur seals. In addition this method "round-up" also results in the detection of flipper-tagged males that are a part of the vital rates study initiated by NMML in 2009 on St. George Island. Crew will be able to capture tagged males, identify their tag numbers and when practical weigh tagged seals. We request that during the round-up method to detect and disentangle entangled males we also are allowed to capture, weigh, and record the number of individually tagged males. This collaboration with NMML will allow us to optimize our efforts into one integrated juvenile male sampling program.

Objective b. Takes of northern fur seals associated with observational entanglement surveys of rookeries and haul outs: Surveys observation points are all located at the periphery of rookeries and haul outs, a minimum of 30 m from the nearest seal, and are chosen to be accessible without disturbing any seals. A limited number of sub-adult and adult male fur seals on haul outs may be taken by disturbance due to changes in wind conditions resulting in seals, via olfactory cues, detecting the presence of researchers conducting surveys. As described previously, harbor seals are not found at northern fur seal hauling grounds, thus they are not included in the incidental take table. Steller sea lions are not found at most northern fur seal hauling grounds on the Pribilof Islands, but can be infrequent visitors to a few sites such that fewer than 10 Steller sea lions would be encountered during any particular survey. On all occasions it is not practical to identify Steller sea lions within a fur seal hauling ground without being detected by and harassing 100s of northern fur seals.

Entanglement surveys conducted as part of the subsistence harvest will involve no additional incidental or intentional harassment due the exemption from taking for subsistence

activities.

Disentanglement captures are included in this permit application along with incidental disturbance caused by disentanglement activities. The estimated number of adult and juvenile male captures is estimated to be approximately 50% of that on St. Paul Island. On St. Paul Island the maximum number of capture attempts recorded between 1998 and 2005 was 97 (2002). Thus, we expect the maximum number of juvenile male capture attempts to be approximately 50/year. ECO does not currently attempt to capture adult female northern fur seals with adult dependent pups on the rookeries. NMML and NMFS Alaska Region staff has trained ECO staff in 2012-15 in the safe capture and restraint of juvenile males as part of round-up sampling to detect tagged males under NMFS Permit No. 14327. Pup captures are included in this permit application in anticipation that we will add this component to our entanglement research in coming years and may encounter entangled pups during our subsistence harvest activities. ECO will initiate any program to attempt pup rookery captures in close consultation with NMFS co-management partners and the Pribilof Islands Fur Seal Coordinator for NOAA Fisheries.

The harassment numbers listed in the Take Table are maximum estimates. The numbers were estimated by the PI in consultation with the co-PI's Mr. Bruce Robson and Dr. Stephen Insley, who have collectively conducted these procedures over the past three decades. Dr. Insley participated in entanglement roundups during the late-1980s and early 1990s. Mr. Robson has been involved in entanglement surveys and captures since 1990, first with the National Marine Mammal Laboratory and since 2002 under the authority of NMFS Permit No. 1066-1750-00, held by Michael T. Williams.

We anticipate the round-up of a majority of fur seals on a haul out to be the safest and most effective procedure. A round-up involves surrounding a group of seals to the extent that the target seals (i.e., tagged or entangled) are contained within the group. The process is the same as that used by Fowler (1987) where it is described in detail. While the seals are contained, they are allowed to spread out to avoid stress, over-heating, and excessive movement. Seals are allowed to escape through a controlled exit (i.e. bottleneck) point where the target (i.e. entangled or tagged) animals can be readily spotted and captured. When a target seal exits, the bottleneck can be quickly closed so that any remaining targets are not simultaneously lost. This process is continued until all target animals are captured, handled, and released.

Objective c. Sources of Entangling Debris - Identify the source of entangling debris to better target management efforts to prevent future fur seal entanglement

Debris removed from entangled seals will be retained, cleaned, and characterized. Entangled seals not disentangled will be photographed and their debris characterized into consistent groups based on characteristics of the debris that can be reliably detected.

Take – Entanglement Program (Take Table 1 rows 2, 3, 4, 5, 8)

We request annual intentional harassment of up to 30,000 northern fur seals caused by individual or "round-up" techniques used to detect entangled and tagged seals. Of those 30,000 seals intentionally harassed, we estimate some portion may be harassed twice. Our intention is to capture tagged or entangled seals not previously detected, but we anticipate that about 25% of the seals taken by harassment (25% x 30,000=7,500) may be harassed more than once during a subsequent round up on another day or at another location. We estimate that up to 50 capture attempts per year will be made on St. George Island for disentanglement if we are able to secure funding for adequate staffing. Therefore, we estimate that we may capture, restrain, weigh, tag, and disentangle 50 seals per year. These takes will be primarily 2-4 year old males, but may also include pups of both sexes or 2-4 year old females. We request take by capture, restraint, and weighing for 500 fur seals per year. These takes will be primarily 2-4 year old males, but may include 2-4 year old females. We also request one unintentional mortality during activities associated with the capture of entangled or tagged seals. Peripheral seals, the ones near those we intend to capture either individually or in the group "round-up" will be incidentally harassed during the round-up/ nearby disentanglement activities, but will escape into the water prior to inclusion into the group to be herded inland for counting and capture. Incidental harassment takes are included in the Take Table.

III. Tanam Amgignaa (Island Sentinel) Program (Methods)

The Tanam Amgignaa (Island Sentinel) Program (TA Program) will be used to record all routine Island Sentinel observations of marine mammals, rookery disturbance monitoring and any observed interactions with humans. Sentinels and associated research assistants will visit marine mammal observation points to census or observe specific species and monitor wildlife areas year-round. The majority of these observational surveys will be conducted from vantage points overlooking the haulouts to the greatest extent practical.

The spatial data structure of the TA Program breaks the island into a series of "regions" in which Sentinels record observations within specific fields of view from defined and repeatable vantage points. Observations are recorded in a standardized format allowing for efficient summarization and reporting. A detailed code system has been designed for (objects, species, their location, direction, distance, condition, behavior, etc.). Codes are drawn from widely used standardized systems such as the NMFS Platforms of Opportunity (POP) database for marine mammals and the North American Bird Codes. The code structure of the database allows for a range of count data, behavioral observations, interaction between species, and recording of trend data based on the observer's memory of conditions or numbers present in the past.

In addition to general survey observations, the TA Program is collecting data that will be used to address northern fur seal life history. Data on female fur seal maternal behavior and reproduction are collected via observations; observations using spotting scopes and binoculars will be made from vantage points overlooking the rookeries and haulouts to examine characteristics of the pelage and vibrissae that are indicative of the relative age of the seal. The National Marine Mammal Laboratory has tagged female and male northern fur seals on St. George Island, we will conduct observations of these known-aged seals in order to
(1) contribute to the NMML life history database,
(2) examine the timing of fur seal arrivals and departure, parturition, and foraging trip durations, and
(3) examine the size of pups handled and released during the harvest (see description in item I-b.).

The majority of these observational data will be collected from cliff tops (primarily South Rookery and South Rookery Reef), inside the harbor, and hauling ground at Zapadni. We expect little or no disturbance or reactions to the observers' presence by the seals, due primarily to cliff-top observations. During these studies, in addition to being a minimum of 30 m away from the seals, we move slowly while keeping a low profile, stop if animals show any signs of detecting our presence, pay close attention to wind direction to avoid seals smelling our nearby presence, and wear clothing that blends into the surroundings. The time frame will be from May to December.

The TA Program will also integrate a network of remote time-lapse cameras installed at harbor seal, northern fur seal, and Steller sea lion hauling grounds. The objectives of the remote camera program are to:
1) remotely conduct census counts and detect harbor seal and Steller sea lion presence at historically-used sites: and
2) evaluate the ability of the technology to provide information on northern fur seal life history.

Take – Island Sentinel Program (Take Table row#9)

The TA will continue to monitor fur seal rookeries and other regularly used marine mammal haul out sites directly (via observation) and remotely (via automated time-lapse cameras) to gather census information and to document natural changes, disturbances, and other anomalies. As more northern fur seals return to the island in June and July of each year the chance of Level B harassment increases as the Island Sentinels observe fur seal activity such that we request the incidental harassment. All activities under TA

program involve only Level B Takes of fur seals. The reaction (take) of seals to all observational activity occurring primarily on South Rookery is expected to only involve brief orientations of seals and no movement away. Additionally, the downloading of photographs and data from, and regular maintenance checks on, remote photographic equipment may involve some Level B harassment of northern fur seals, but is unlikely to cause any disturbance to harbor seals and/or Steller sea lions. Cameras will be positioned a minimum of 30 m to the nearest seal and will be situated so that access can be obtained without causing any disturbance (e.g. from cliff-tops). Sentinels will work in coordination with other researchers conducting permitted research activities on fur seal rookeries when conducting observations that may cause a disturbance to fur seals.

For all these programs we also request incidental harassment of Steller sea lions and harbor seals.

Timeframe

Biosample Program:
- June-November: northern fur seal subsistence harvest biosample collection
- Year-round: Other subsistence hunted/harvested, and stranded animals; biosample collection; Marine Mammal Tooth Collection; Subsistence Food Safety, Health, Security

Entanglement Program = June – December: Observational and Round-up entanglement surveys; Fur seal subsistence harvest entanglement surveys; Disentanglement captures

Island Sentinel Program = Observations occur year-round

References

Antonelis, G.A. 1992. Northern fur seal research techniques manual. U.S. Department of Commerce, Seattle. NOAA Technical Memorandum NMFS F/NWC-214. 47p.

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Gentry, R. L., and J. R. Holt. 1982. Equipment and techniques for handling northern fur seals. NOAA Technical Memorandum NMFS-SSRF-758.

Scheffer, VB, 1962. Pelage and surface topography of the northern fur seal. US Fish and Wildlife Service, N. American Fauna No. 64.

Vladimirov, V. A., and V. S. Nikulin. 1993. Preliminary investigation of age-sex structure of northern fur seals on the Pribilof Islands, 1991. Pages 61-73 In E. H. Sinclair (ed.) Fur Seal Investigations, 1991. U.S. Department of Commerce NOAA Technical Memorandum NMFS-AFSC-24.

Zavadil, P.A., B.W. Robson, A.D. Lestenkof, R. Holser and A. Malavansky and Ryan Kingsbury. 2006. Northern Fur Seal Entanglement Studies on the Pribilof Islands in 2006. Available from the Aleut Community of St. Paul Island Ecosystem Conservation Office.

Supplemental Information

Status of Species:	Marine mammal specimens of all species managed by NMFS will be collected, salvaged and/or received, but only entangled northern fur seals (Callorhinus ursinus) will be actively taken during disentanglement procedures. The three species of marine mammal affected include: - Western stock of Steller Sea Lion (Eumetopias jubatus) – ESA Endangered and MMPA Depleted - northern fur seals (Callorhinus ursinus) – MMPA Depleted - Pribilof Islands stock of harbor seals (Phoca vitulina) - protected under the MMPA, not depleted.
Lethal Take:	No intentional lethal take. Mortality during capture/handling is possible. If it occurs and the necessary expertise is available a full necropsy will be conducted; if unavailable, we would store the animal on the freezer for future necropsy, which will help determine whether entangled seals died due to entanglement related injuries (e.g. deep wounds, systemic infections), to capture/handling stress, or both. We request unintentional mortality (UM) of up to 1 NFS. If more than this # of UM occurs in a single yr determined to be primarily due to capture/handling (e.g. no existing wound caused by the entangling debris), capture operations will be suspended pending consultation with NMFS. Untreated entangled seals eventually result in mortality. Euthanasia (e.g., blunt force trauma).
Anticipated Effects on Animals:	There is a very low likelihood that any of the survey techniques proposed in this modification could cause seals to stampede in a manner that could cause injury or death. Project personnel are trained to stop moving and lower their profile in the event of a disturbance in order to minimize any disturbance related movement on a haulout or rookery. The indirect effects of the disturbance to the animals caused by our presence during our proposed activities are addressed in the following section. The disentanglement captures will be conducted in a manner that reduces disturbance to adjacent seals and minimizes disturbance to rookery and haul out areas. Incidental harassment of individual seals close to those being targeted for capture will be of short duration (i.e. < 1 hour). The slow crawling approach technique minimizes the number of seals that are harassed in this way. Those seals directly in the approach path are able to move away in a slow relaxed manner. In addition, once captured, the target seal is moved away from the initial area, allowing any incidentally harassed seals to quickly resume normal activities. In addition, in situations where capture attempts will cause unacceptable disturbance to haul out areas, sightings will be recorded (and seals photographed) and the location of entangled seals will be monitored to the greatest extent possible to increase the likelihood of future capture opportunities. To avoid disturbance to rookery areas, attempts to capture entangled northern fur seal pups will be made primarily when pups are hauled out in areas on the edges of the breeding rookeries.
Measures to Minimize Effects:	Measures to Minimize Effects: Observational vantage points are chosen so that there will normally be a minimum amount of disturbance if there is any at all. During the behavioral observations being conducted from the cliff side, observers move carefully and slowly and avoid being visible to the seals below. The distance to the seals below is minimally 30 m. Some disturbance to nearby seals will occur during the disentanglement captures which are conducted on an opportunistic basis (ca. once or twice per week). However, by using a slow crawling approach (as noted above), this disturbance can be kept to a minimum. While slowly moving towards an entangled seal, we are normally between 5 to 30 m from the seals. In this slow moving manner, the seals are given ample time to slowly move away from a researcher and thus it is possible to avoid panic "running". The same technique also makes it possible to approach the subject closely prior to capture, thus minimizing the number of nearby seals disturbed. Finally, restraint of the captured seals will occur out of line-of-sight of the group so that activities may quickly return to normal. Monitoring effects of activities: Round-up surveys of juvenile and adult males will have a short-term and small energetic cost on those individuals herded inland. Numerous studies have investigated the effects of round-ups and have been unable to detect any long-term redistribution of seals as a result of round-ups (see NMFS

	2014). Capturing, weighing, and restraining tagged and disentangling entangled seals will have an effect on them initially. Following disentanglement (and weighing for tagged seals), the seal will be released and be monitored during reintegration with the other seals. Our protocol is to remain with the seal until it begins to walk towards other seals or towards the water. This is normally immediate. Reintegration into the group is not critical for the seal's well being (seals are solitary for the majority of their lives) and so is not an essential part of the post capture protocol. If the seal does not immediately move towards other seals or towards the water one of the capture team will remain with it for up to one hour. No direct intervention is deemed necessary or will be attempted. No drugs or other substances with lasting effects will be administered so recovery from capture is expected to be immediate. Prior to all capture attempts a count will be made of the number of seals in the capture area. A second count will be made following the release of an entangled seal (or after an unsuccessful capture attempt) to ascertain the number of seals that left the area due to capture disturbance. Records of repeat observations of disentangled or tagged seals will provide us an indication of the duration and extent of effects experienced by those individuals captured. Alternatives: Other than disentanglement through direct intervention, there are no alternatives that we are aware of. Without such direct intervention, most cases of entanglements are expected to be lethal.
Resources Needed to Accomplish Objectives:	In July 2001, the Aleut Community of St. George Island entered into a co-management agreement with the National Marine Fisheries Service for the management of northern fur seals and Steller sea lions. The activities described herein are in fulfillment of our co-management responsibilities for which funding has been made available through an annual budget. These include our Biosample Program, our Entanglement Program, and our Island Sentinel Program. Other funds: Additional supplementary funds are described below by project/program. Teeth Sectioning: The St. George Island ECO participated in the World Wildlife Fund's (WWF) Coastal Communities for Science (CCS) program funded by the National Science Foundation in 2005. This program provided the training and equipment necessary to section marine mammal teeth, including but not limited to northern fur seals and Steller sea lion, for the purpose of aging individual animals and reading nursing lines for determining growth. There is currently no funding for this project. Entanglement Program: The St. George Island ECO has received funding in collaboration with St. Paul ECO in past years to perform entanglement monitoring and disentanglement activities on fur seals. Continuation of this program is necessary to further address the issue of fur seal entanglement and progress toward preventing future entanglement by addressing the source of marine debris. The ECO entanglement program has no funding for directed entanglement research. Island Sentinel: The primary funding for Island Sentinel activities comes from the NMFS Alaska Regional Office, Alaska Native Co-management Funding Program. Additional funds for equipment (i.e. time-lapse photographic gear) has been provided by the Alaska Fisheries and Development Foundation (AFDF) and the World Wildlife Fund (WWF).
Disposition of Tissues:	Samples sent to collaborators (including samples sent for educational purposes): researchers are responsible for disposition after completion of use. The samples may be permanently transferred according to NMFS regulations governing the taking and importing of marine mammals (50 CFR 216.37) and the regulations governing the taking, importing, and exporting of endangered and threatened species (50 CFR 222.308).
Public Availability of Product/Publications:	Research results and activities will be made widely available on our website (http://www.stgeorgeislandinstitute.com/st-george-island.html). Results will also be published and made available in the appropriate referred scientific journals or as technical reports at the discretion of the ECO staff as time and funding allows. All publications will be in compliance with any funding requirements. Samples sent to and analyzed by external researchers may result in additional

publication.

Location/Take Information

Location

Research Area: Pacific Ocean State: AK
Location Description: Activities may occur at any time of year in St. George Is., Bering Sea, Alaska.

Take Information

Line	Ver	Species	Listing Unit/Stock	Production /Origin	Life Stage	Sex	Expected Take	Takes Per Animal	Take Action	Observe /Collect Method	Procedure	Transport Record	Begin Date	End Date
1		Seal, Northern fur	Eastern Pacific Stock	Wild	pup	Male and Female	200	1	Capture/Handle/Release	Survey, ground	Measure (standard morphometrics); Photo-id; Photograph/Video; Restrain, board; Restrain, net; Weigh	N/A	9/14/2016	9/30/2021
		Details: Weigh up to 200 non-harvested pups to determine sex and condition during group "round-up" technique used to capture seals for subsistence.												
2		Seal, Northern fur	Eastern Pacific Stock	Wild	All	Male and Female	500	1	Capture/Handle/Release	Survey, ground	Measure (standard morphometrics); Photo-id; Photograph/Video; Restrain, board; Restrain, net; Weigh	N/A	9/14/2016	9/30/2021
		Details: Capture of tagged northern fur seals to record their tag # and weight when captured during subsistence harvest & disentanglement activities.												
3		Seal, Northern fur	Eastern Pacific Stock	Wild	All	Male and Female	50	1	Capture/Handle/Release	Survey, ground	Mark, flipper tag; Mark, other (e.g., neoprene patch); Measure (standard morphometrics); Other; Photo-id; Photograph/Video; Restrain, board; Restrain, net; Weigh	N/A	9/14/2016	9/30/2021
		Details: "Mark, other" = shave mark; "Other" = capture of entangled northern fur seals to disentangle them.												

4		Seal, Northern fur	Eastern Pacific Stock	Wild	All	Male	30000	1	Harass	Survey, ground	Other	N/A	9/14/2016	9/30/2021
		Details: Intentional harassment caused by group "round-up" technique used to capture/disentangle more than 1 seal in same group. "Other" = the round-up technique. All life stages including weaned pups and older.												
5		Sea lion, Steller	West of 144° Long (Western US) (NMFS Endangered)	Wild	All	Male and Female	500	1	Harass	Survey, ground	Collect, molt; Collect, scat; Collect, spew; Count/survey; Incidental disturbance; Observation, monitoring; Observations, behavioral; Photo-id; Photograph/Video; Remote video monitoring	N/A	9/14/2016	9/30/2021
		Details: Incidental harassment to peripheral seals while collecting samples from the ground and from subsistence hunted & dead stranded marine mammals; and other biosampling, disentanglement, and Island Sentinel activities.												
6		Seal, harbor	Range-wide	Wild	All	Male and Female	10	1	Harass	Survey, ground	Collect, molt; Collect, scat; Collect, spew; Count/survey; Incidental disturbance; Observation, monitoring; Observations, behavioral; Photo-id; Photograph/Video; Remote video monitoring	N/A	9/14/2016	9/30/2021
		Details: Pribilof Is. Stock; Incidental harassment to peripheral seals while collecting samples from the ground and from subsistence hunted & dead stranded marine mammals; and other biosampling, disentanglement, and Island Sentinel activities.												
7		Seal, Northern fur	Eastern Pacific Stock	Wild	All	Male and Female	4900	1	Harass	Survey, ground	Collect, molt; Collect, scat; Collect, spew; Count/survey; Incidental disturbance; Observation, monitoring; Observations, behavioral; Photo-id; Photograph/Video; Remote video monitoring	N/A	9/14/2016	9/30/2021
		Details: Incidental harassment to peripheral seals while collecting samples from the ground and from subsistence hunted & dead stranded marine mammals; and other biosampling, disentanglement, and Island Sentinel activities.												
8		Seal, Northern fur	Eastern Pacific Stock	Wild	All	Male and Female	1	1	Unintentional mortality	Other	Intentional (directed) mortality; Salvage (carcass, tissue, parts); Unintentional mortality	N/A	9/14/2016	9/30/2021

	Details: Unintentional mortality during capture/disentanglement of northern fur seals or harassment; necropsy. Euthanasia if warranted.

Location

Research Area: Pacific Ocean State: AK
Location Description: Annual collection, receipt, & export of biological samples (hard and soft parts) from dead wild marine mammals. Samples may be exported world-wide.

Take Information

Line	Ver	Species	Listing Unit/Stock	Production /Origin	Life Stage	Sex	Expected Take	Takes Per Animal	Take Action	Observe /Collect Method	Procedure	Transport Record	Begin Date	End Date
1		Sea lion, Steller	West of 144° Long (Western US) (NMFS Endangered)	Wild	All	Male and Female	35	99999	Import/export/receive only	Survey, ground	Import/export/receive, parts; Measure (standard morphometrics); Other	N/A	9/14/2016	9/30/2021
		Details: Biosample Program - Salvage & export samples (hard and soft parts) of subsistence hunted & dead stranded (beach cast) animals. Unlimited samples from up to 35 animals. Other = collection & receipt of samples.												
2		Seal, harbor	Range-wide	Wild	All	Male and Female	20	99999	Import/export/receive only	Survey, ground	Import/export/receive, parts; Measure (standard morphometrics); Other	N/A	9/14/2016	9/30/2021
		Details: Pribilof Is. Stock; Biosample Program - Salvage & export samples (hard and soft parts) of subsistence hunted & dead stranded (beach cast) animals. Unlimited samples from up to 20 animals. Other = collection & receipt of samples.												
3		Seal, Northern fur	Eastern Pacific Stock	Wild	All	Male and Female	670	99999	Import/export/receive only	Survey, ground	Import/export/receive, parts; Measure (standard morphometrics); Other	N/A	9/14/2016	9/30/2021
		Details: Biosample Program - Salvage & export samples (hard and soft parts) of subsistence hunted & dead stranded (beach cast) animals. Unlimited samples from up to 670 animals. Other = collection & receipt of samples.												
4		Cetacean, unidentified	NA	Wild	All	Male and Female	10	99999	Import/export/receive only	Survey, ground	Import/export/receive, parts; Measure (standard morphometrics); Other	N/A	9/14/2016	9/30/2021
		Details: Biosample Program - Salvage & export samples (hard and soft parts) of subsistence hunted & dead stranded (beach cast) animals. Unlimited samples from up to 10 individual cetaceans. Other = collection & receipt of samples.												

5		Pinniped, unidentified	NA	Wild	All	Male and Female	10	99999	Import/export/receive only	Survey, ground	Import/export/receive, parts; Measure (standard morphometrics); Other	N/A	9/14/2016	9/30/2021
		Details: Bio/Prog - Salvage & export samples of subsistence hunted & dead stranded animals. Unlimited samples from up to 10 individual pinnipeds other than NFS, HS, and SSL. Other = collection & receipt of samples.												

NEPA Checklist

1) If your activities will involve equipment (e.g., scientific instruments) or techniques that are new, untested,or otherwise have unknown or uncertain impacts on the biological or physical environment , please discuss the degree to which they are likely to be adopted by others for similar activities or applied more broadly.

The research does not involve any new, innovative, controversial and/or experimental equipment or techniques.
2) If your activities involve collecting, handling, or transporting potentially infectious agents or pathogens (e.g., biological specimens such as live animals or blood), or using or transporting hazardous substances (e.g., toxic chemicals), provide a description of the protocols you will use to ensure public health and human safety are not adversely affected, such as by spread of zoonotic diseases or contamination of food or water supplies.

The activities do not involve the collection, handling, or transport of potentially infectious agents or pathogens and/or the use or transport of hazardous substances; any samples would not be shipped using hazardous materials and any tissue collected is not considered infectious or a potential to contain pathogens. The research techniques are established for stranded marine mammals and have been shared with Alaska Native communities through the "Cooperative Effort between Alaska Native People and Federal Agencies on Marine Mammal and Bird Stranding Program."
3) Describe the physical characteristics of your project location, including whether you will be working in or near unique geographic areas such as state or National Marine Sanctuaries, Marine Protected Areas, Parks or Wilderness Areas, Wildlife Refuges, Wild and Scenic Rivers, designated Critical Habitat for endangered or threatened species, Essential Fish Habitat, etc. Discuss how your activities could impact the physical environment, such as by direct alteration of substrate during use of bottom trawls, setting nets, anchoring vessels or buoys, erecting blinds or other structures, or ingress and egress of researchers, and measures you will take to minimize these impacts.

None of our activities impacts the physical environment through any sort of alteration of the substrate or otherwise.
4) Briefly describe important scientific, cultural, or historic resources (e.g., archeological resources, animals used for subsistence, sites listed in or eligible for listing in the National Register of Historic Places) in your project area and discuss measures you will take to ensure your work does not cause loss or destruction of such resources. If your activity will target marine mammals in Alaska or Washington, discuss measures you will take to ensure your project does not adversely affect the availability (e.g., distribution, abundance) or suitability (e.g., food safety) of these animals for subsistence uses.

The activities will not cause loss or destruction of significant scientific, cultural or historic resources. In fact, allowing coastal Alaska Native subsistence users to send in parts or specimens to a permitted Alaska Native organization acknowledges the cultural importance and continued uses of marine mammals.
5) Discuss whether your project involves activities known or suspected of introducing or spreading invasive species, intentionally or not, (e.g., transporting animals or tissues, discharging ballast water, use of equipment at multiple sites). Describe measures you would take to prevent the possible introduction or spread of non-indigenous or invasive species, including plants, animals, microbes, or other biological agents.

Samples will only be taken from dead stranded (also sometimes referred to as beach cast) marine mammals and/or from Alaska Native subsistence users practicing customary and traditional use of marine mammals. Transportation will be in sealed containers of frozen parts or parts fully bathed in a suitable storage agent such as ethanol. Such transport will only occur first, with the

understanding and approval of regional NMFS officials and second, where the items are being transported to approved and designated personnel at an approved facility.

Project Contacts

Responsible Party: Chris Merculief
Primary Contact: Chris Merculief
Principal Investigator: Chris Merculief

Other Personnel:

Name	Role(s)
Stephen Insley	Co-Investigator
Dennis Lekanof	Co-Investigator
Bruce Robson	Co-Investigator

Attachments

Application Archive - P19592T14Issued.pdf (Added Sep 20, 2016)
Contact - Bruce Robson C8852T5Robson_CV_19436_19592.pdf (Added May 10, 2016)
Contact - Chris Merculief C8853T5Merculief_Resume_19592.pdf (Added May 10, 2016)
Contact - Dennis Lekanof C19530T5Lekanof_Resume_19592.pdf (Added May 10, 2016)
Contact - Stephen Insley C8460T5Insley_CV_19436_19592.pdf (Added May 10, 2016)
Project Description - P19592T119592TableofSamplesStGeorge.docx (Added Apr 11, 2016)

Status

Application Status:	Application Complete
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• MMPA/ESA Research/Enhancement permit
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Section 7 Consultation: N/A
NEPA Analysis: N/A
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Modification Requests

Reports

Reports Required

Nbr	Report Type	Report Period		Date Due	Status	Date Received
		Start Date	End Date			
1	Annual	09/14/2016	09/30/2017	12/31/2017	N/A	
2	Annual	10/01/2017	09/30/2018	12/31/2018	N/A	
3	Annual	10/01/2018	09/30/2019	12/31/2019	N/A	
4	Annual	10/01/2019	09/30/2020	12/31/2020	N/A	
5	Annual	10/01/2020	09/30/2021	12/31/2021	N/A	
6	Final	09/14/2016	09/30/2021	03/31/2022	N/A	